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GRANULAR VERMICULITE DEODORANTS

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1 Claim. (Cl. 167-94)

My invention relates to deodorants and has particular relation to vaporizable space deodorants which, when dissipated into the air, neutralize an offensive odor by masking or covering it with a more pleasing one.

Deodorants of the type with which my invention concerns itself have a wide range of uses extending from the deodorizing of unpleasant odors in a kitchen or bath room to the masking or overcoming of very strong objectionable odors such as occur in sick rooms, in animal cages, or in the vicinity of dead rats. In accordance with the teachings of the prior art, the deodorizing effect is produced by dissipating into the air a volatile perfume or deodorizer which is usually supplied in solid or liquid form, but may also be a vapor. I shall call this solid, liquid or vapor the odorant. A number of odorants are described in *Modern Chemical Specialties—Lesser*—© 1950—MacNair-Dorland Co., New York, pages 491 through 503. The dissipation of the odorant may be effected in several ways. The deodorant may be evaporated from a shallow, open receptacle, or it may be evaporated from a wick, or it may be sprayed in or scattered over the region where the deodorizing effect is to be produced.

The prior art facilities for dissipating odorants have proved unsatisfactory. The practice of evaporating from a receptacle is inherently costly. It is an important property of the odorant that only small quantities, in many situations only a few drops, are required to produce effective deodorization. But small quantities of the liquid cannot conveniently be measured out in a receptacle which would be suitable for evaporation and the quantity placed in the receptacle is usually at least several times as much as may be necessary. Since the cost of the odorant is high, this wasteful use of the liquid leads to a high cost for deodorizing a region.

In addition, the odorant in the receptacle is concentrated in a small area. The deodorizing effect is then strong in the immediate vicinity of the receptacle and falls off precipitously as the distance from the receptacle increases. The masking odor is then rather faint at a relatively short distance from the receptacle. This difficulty may be overcome by providing a large quantity of the material in the evaporator but in this case the odor in the region of the evaporator is excessively strong and unpleasant. Another expedient is to provide a fan to dissipate the odorant but this has the disadvantage of complexity.

The wick method has the disadvantage of the receptacle method that the deodorizing liquid is concentrated so that its effect decreases to a great extent with the distance from the wick and either a fan is required or a number of wicks must be used. Further, the odorants are usually solutions or emulsions of several liquids (see *Modern Chemical Specialties—Lesser*) which are fractionally vaporized through the wick. The less volatile components of the odorant are then retained in the wick and it so to speak becomes clogged and relatively ineffective.

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The spraying or dropping of the material has the disadvantage that it is wasteful and that the material may damage the surface on which it is sprayed or deposited. I have found that the deposit of drops of most deodorizing liquids on a painted surface or one of asphalt tile mars the surface.

Of the above described practices the receptacle method and the spraying or dropping method have the additional disadvantage that they permit the liquid to evaporate quickly. The effect of the vapor given up by the deodorizing liquid at any instant is only momentary because the vapor is quickly diffused even in a relatively closed region. When the liquid evaporates quickly, it is thus quickly used up and in situations where the deodorizing effect must be produced for long time intervals the liquid must be continuously replenished at a high cost. In addition the rapid evaporation results in high concentration, particularly near the odorant source and this is disagreeable.

It is, accordingly, broadly an object of my invention to provide a deodorant which can be economically applied to produce an effective deodorizing effect.

It is another object of my invention to provide a deodorant which shall be capable of producing an effective substantially uniform masking or deodorizing effect over a region of reasonable volume.

A further object of my invention is to provide a deodorant with which it shall be possible to maintain a suitable concentration of deodorizing vapor for a substantial time interval which may be as long as twenty-four hours.

A still further object of my invention is to provide a deodorant with which it shall be possible to maintain a uniform concentration of vapor over the region to be deodorized for a substantial length of time without damaging the floor or the walls of the region.

An incidental object of my invention is to provide facilities for effectively and economically deodorizing a region which is of relatively small volume and which requires only a few drops of deodorant.

In accordance with my invention I provide a deodorant consisting of a particled material of the type that is capable of absorbing large quantities by weight of a deodorizing liquid or vapor; that is, of an odorant, while remaining dry, that is, without becoming soggy, impregnated with a substantial quantity of the order of 25% of its weight of an odorant. The particled material must be such that when the impregnated particles are exposed to the atmosphere in a room, for example, a toilet, a perfume corresponding to the odorant is emitted. It is essential that the particled material shall not react with the odorant either chemically or physically selectively so as to change the character of the perfume. I will call a particled solid which does not chemically or physically react so as to change the perfume of the odorant a non-reactive solid.

I have found that suitable particled materials are such solids as attapulgite, vermiculite, sawdust and fuller's earth. Such materials can, without becoming soggy, absorb substantial quantities by weight of an odorant. A typical such odorant is neutroleum alpha which is sold by Fritzsche Brothers of Port Authority Bldg., 76 Ninth Ave., New York 11, N. Y. Further, I have found that when a proper quantity of the impregnated material, such as impregnated vermiculite, for example, is spread on the floor or on a suitable part of the floor of a room, vapor or perfume, corresponding to the impregnated odorant unchanged in any way, is emitted from the material at a sufficient rate to produce an effective deodorizing effect and still not at such a high rate that the masking odor becomes unpleasant. In addition, the

rate of evaporation is such that the material remains effective for a long time interval of the order of twenty-four hours. I have also found that the rate of emission of the vapor and the magnitude of the deodorizing effect can be controlled by selecting the size of the granule of the impregnated particled solid, an impregnated material of larger granules being appreciably more retentive than an impregnated powdery material. I have found that the impregnated material can, but need not, be spread over the whole floor of the room. It can be spread over an area which is a relatively small proportion of the total area of the room but the area must be sufficiently large to avoid the concentration of odor which arises in the prior art use of receptacles described above. Preferably the impregnated material should be deposited in several regions of the room which are so distributed that the deodorizing effect is substantially uniform throughout the room. The exact pattern of distribution will in each case depend on the geometry of the room.

In the practice of my invention I have produced deodorants consisting of the particled solids listed in Table I impregnated with the odorants listed in Table II.

Table I

Solid	Supplier
Vermiculite.....	Zonolite Company Dept. R, 135 S. La Salle St., Chicago 3, Illinois.
Sawdust.....	Attapulugus Division, Minerals & Chemicals Corp. of America, 210 West Washington Square, Philadelphia 5, Pa.
fuller's earth (Attapulugus clay) 8/20 mesh AA grade RVM granular.	Attapulugus Division, Minerals & Chemicals Corporation of America. Do.
fuller's earth (Attapulugus clay) 4/12 mesh AA grade RVM granular attapulugus.	Do.
"Columbia" activated carbon 6/14 mesh grade A.C.	Carbide and Carbon Chemical Co., 30 E. Forty-second St., New York 17, N. Y.
fuller's earth.....	Floridin Co., P. O. Box 998, Tallahassee, Florida.

Table II

Odorant	Supplier
Neutroleum Alpha.....	Fritzsche Brothers.
Animal Products Deodorizer No. 23576.....	Do.
Deodorant No. 10753.....	Do.
Deodorant No. 15075.....	Do.
Deodall No. 1 odorant.....	Sindar Corp. of 330 W. Forty-Second St., N. Y.
40-R-4787.....	Dodge & Olecott of 180 Varich St., New York, N. Y.
Citro Rodorant.....	Florida Molasses Co., Lake Alfred, Florida.

The various types of vermiculite available and its chemical and physical properties are described in a Zonolite leaflet G-81 copyright 1953, entitled Zonolite Vermiculite. Animal products deodorizer No. 23576 is a modification of neutroleum alpha, the modification consisting of the removal of a possibly toxic material.

The odorants listed in Table II are described by their manufacturers as having compositions as follows:

Neutroleum alpha:	Percent
Essential oils.....	88
Aromatic chemicals.....	5.2
Fixatives.....	6.8
Deodorizer No. 23,576:	Percent
Essential oils.....	94½
Aromatic chemicals.....	4½
Fixatives.....	1
Deodorant No. 10,753:	Percent
Essential oils.....	90.7
Aromatic chemicals.....	8.8
Fixatives.....	.5

Deodorant No. 15,075: Percent
Essential oils..... 100

40-R-4787 called citrona 40R4787:
Blend of essential oils and aromatic chemicals

5 Citro Rodorant:
A heavy citrus oil fraction recovered by steam distillation of stripper oil

10 Deodall #1:
A mixture of synthetic and natural aromatic and essential oils.

I produced a number of units of the deodorant combination according to my invention by impregnating a small quantity of each solid in Table I with about one-third of its weight of neutroleum alpha and by impregnating vermiculite with about one-third to an equal weight of each of the odorants in Table II. In each case the odorant was simply poured into a mass of the solid and the mass tumbled for an interval of a half-hour. All deodorant combinations were dry. Each deodorant was spread on a selected out-of-the-way area, about one square foot of the floor of a rest room of the usual dimensions and the deodorizing effect was observed over a period of 24 hours. I found that each of the deodorant combinations from the start produced a deodorizing effect by emitting unchanged the perfume of the odorant. In each case the perfume or odor was still emitted to some extent after 24 hours but the odor for all but impregnated Vermiculite of size No. 2 was weak. The spreading of the impregnated solid over one square foot of the small rest room resulted in adequate distribution of the perfume so that the deodorizing was effective and a disagreeable concentrated effect was not produced.

35 Vermiculite No. 2 is an expanded or exfoliated vermiculite having a density of 8.5 to 9.0 pounds per cubic foot and having the following particle size distribution—

U. S. screen:	Cumulative percent
4.....	Trace
6.....	10
8.....	48
16.....	95
30.....	98
45.....	99
Pan.....	100

It is seen that substantially 98% of the particles are between 4 and 30 U. S. screen mesh.

It is to be noted that while all deodorants listed are suitable for many purposes and fall within the broader aspects of my invention, the impregnated vermiculite has peculiar advantages which render it preferable where the deodorant effect is to persist for a long time.

55 When a space or room is to be deodorized with the deodorant according to my invention, the proper quantity of impregnated particled solid is deposited over small areas of out-of-the-way portions of the space, the areas corresponding to the volume of the space to be deodorized; the impregnated solid may also be deposited on a suitable platform in the space. The solid preferably should have a composition and a granular or particled size such that the vaporization takes place for the desired interval of time. Since the solid is dry, the depositing of the solid does not damage paint or wood or the material of the floor or walls of the space. The deodorant is vaporized from the solid and produces its effect uniformly throughout the space and relatively uniformly over a long time interval. Fans or other means of distributing the masking vapor are not required. Thus the proper vapor concentration is maintained without any costly mechanical equipment or wicks or other components.

Advantages are also involved in the marketing of materials in accordance with my invention. Sufficient impregnated particled material for deodorizing a room of

average dimensions or average volume may be enclosed in sealed, readily openable containers, such as a heat sealed cellophane bag and sold for the dimensions or volume of room involved. The buyer of such a bag of material need only break the seal and distribute the material.

Thus assume that a sufficient deodorant to deodorize a small rest room for several hours is desired. Such a deodorizing effect may be produced by five or ten drops of an odorant but five or ten drops of an odorant can not be readily sold. Accordingly, the deodorant is, in accordance with the teachings of the prior art, sold in large quantities and the user is subjected to the cost of distributing the odorant properly.

In accordance with my invention, a sufficient quantity of the impregnated particled solid to produce the effect of five or ten drops of the odorant is deposited in a heat sealed cellophane bag. This may be from about a teaspoon to a tablespoon of the impregnated solid. In use the seal may be broken and the impregnated particled solid in the bag distributed in the room to be deodorized.

Small quantities, convenient for the use, of the impregnated particled solid may also be distributed in readily openable heat-sealed containers for use as samples by

prospective users of large quantities. Thus in a low cost manner the advantages of the material may be demonstrated.

While I have described certain specific embodiments of my invention, many modifications thereof are practicable. My invention, therefore, is not to be restricted except insofar as is necessitated by the spirit of the prior art.

I claim as my invention:

A dry granular odoriferous composition comprising an absorptive material of granular particles of exfoliated vermiculite, substantially 98% of said particles being between No. 4 U. S. screen mesh and No. 30 U. S. screen mesh and at least 25% by weight of the absorptive material of the liquid odorant Neutroleum Alpha absorbed in said material, the said composition remaining dry and having the characteristic of freely evolving the odorant vapors at a slow rate so that spaces may be deodorized for long periods of time by disposing a small quantity of the composition therein.

References Cited in the file of this patent

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